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09 720,609	12 26 2000	Masaki Aoki	NAK1-BN46	2430

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EXAMINER

YUN, JURIE

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/720,609

Applicant(s)

AOKI ET AL.

Examiner

Jurie Yun

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 2-10 and 18-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18, 19, 21, 26 and 27 is/are allowed.
- 6) ☒ Claim(s) 2, 5, 6, 9, 20 and 22-25 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 7, 8 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because it contains more than 150 words. Correction is required. See MPEP § 608.01(b).
2. Claims 2-9 and 18-19 are objected to because of the following informalities: "Plasm" should be "Plasma". Appropriate correction is required.
3. Claims 20-27 are objected to because of the following informalities: It is unclear what is meant by the "loss factor tan" of the dielectric layer. One of ordinary skill in the art would not know how to calculate the loss factor tan of a material. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
5. Claims 2, 5, 6, 9, 20, and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shoji (JP 09-278482).
6. With respect to claim 20, Shoji discloses (Detailed Description, paragraph 4) a plasma display panel in which a space between a first plate and a second plate facing each other is filled with a discharge gas, a plurality of pairs of display electrodes made of Ag are formed on a surface of the first plate facing the second plate, and the surface of the first plate is covered with a dielectric layer covering the plurality of pairs of display

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electrodes. Shoji is silent as to the material of the display electrodes, but one of ordinary skill in the art would know that the use of Ag for display electrodes is well known. Shoji also discloses (Table 1, sample 1) the dielectric layer is made of a glass that contains at least ZnO and 10 wt% or less of  $R_2O$  and does not substantially contain PbO and  $Bi_2O_3$ , wherein R is selected from a group consisting of Li, Na, K, Rb, Cs, Cu, and Ag.

Shoji does not disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. However, since the same materials are disclosed, one of ordinary skill in the art would assume this to be the case. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shoji invention and disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. Shoji is concerned with (Problems to be Solved by the Invention, paragraph 8) lowering the dielectric constant (a.k.a. permittivity), which in turn would result in a lower product of permittivity and loss factor  $\tan$  of the dielectric layer. This equates to lower power consumption, which is another objective.

7. With respect to claim 2, Shoji discloses the permittivity of the dielectric layer is 7 or less (Problems to be Solved by the Invention, paragraph 11).

8. With respect to claim 5, Shoji discloses (Table 1, sample 5) the dielectric layer is composed of a ZnO-base glass which contains 20-44 wt% of ZnO, 38-55 wt% of  $B_2O_3$ , 5-12 wt% of  $SiO_2$ , 10 wt% or less of  $R_2O$ , and 10 wt% or less of MO, and the permittivity of the dielectric layer is 7 or less, wherein R is selected from a group consisting of Li,

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Na, K, Rb, Cs, Cu, and Ag, and M is selected from a group consisting of Mg, Ca, Ba, Sr, Co, and Cr.

9. With respect to claim 6, Shoji discloses (Table 1, sample 5) the dielectric layer is composed of a ZnO-base glass which contains 20-43 wt% of ZnO, 38-55 wt% of B<sub>2</sub>O<sub>3</sub>, 5-12 wt% of SiO<sub>2</sub>, 1-10 wt% of Al<sub>2</sub>O<sub>3</sub>, 10 wt% or less of R<sub>2</sub>O, and 10 wt% or less of MO, and the permittivity of the dielectric layer is 7 or less, wherein R is selected from a group consisting of Li, Na, K, Rb, Cs, Cu, and Ag, and M is selected from a group consisting of Mg, Ca, Ba, Sr, Co, and Cr.

10. With respect to claim 9, Shoji discloses (Table 1, sample 2) the dielectric layer is composed of a ZnO-base glass which contains 35-60 wt% of ZnO, 25-45 wt% of B<sub>2</sub>O<sub>3</sub>, 1-12 wt% of SiO<sub>2</sub>, 1-10 wt% of Al<sub>2</sub>O<sub>3</sub>, and 5 wt% or less of K<sub>2</sub>O, and the permittivity of the dielectric layer is 7 or less.

11. With respect to claim 22, Shoji discloses (Detailed Description, paragraph 4) a plasma display panel in which a space between a first plate and a second plate facing each other is filled with a discharge gas, a plurality of pairs of display electrodes made of Ag are formed on a surface of the first plate facing the second plate, and the surface of the first plate is covered with a dielectric layer covering the plurality of pairs of display electrodes. Shoji is silent as to the material of the display electrodes, but one of ordinary skill in the art would know that the use of Ag for display electrodes is well known. Shoji also discloses (Table 1, sample 1) the dielectric layer is made of a glass which is composed of 30-45 wt% of ZnO, 40-60 wt% of B<sub>2</sub>O<sub>3</sub>, and 1-15 wt% of SiO<sub>2</sub>

Shoji does not disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. However, since the same materials are disclosed, one of ordinary skill in the art would assume this to be the case. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shoji invention and disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. Shoji is concerned with (Problems to be Solved by the Invention, paragraph 8) lowering the dielectric constant (a.k.a. permittivity), which in turn would result in a lower product of permittivity and loss factor  $\tan$  of the dielectric layer. This equates to lower power consumption, which is another objective.

12. With respect to claim 23, Shoji discloses (Detailed Description, paragraph 4) a plasma display panel in which a space between a first plate and a second plate facing each other is filled with a discharge gas, a plurality of pairs of display electrodes made of Ag are formed on a surface of the first plate facing the second plate, and the surface of the first plate is covered with a dielectric layer covering the plurality of pairs of display electrodes. Shoji is silent as to the material of the display electrodes, but one of ordinary skill in the art would know that the use of Ag for display electrodes is well known. Shoji also discloses (Table 1, sample 8) the dielectric layer is made of a glass which is composed of 30-45 wt% of ZnO, 40-55 wt% of  $B_2O_3$ , 1-10 wt% of  $SiO_2$ , 1-10 wt% of  $Al_2O_3$ , and 1-5 wt% of CaO.

Shoji does not disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. However, since the same materials are disclosed, one of ordinary skill in the art would assume this to be the case. It would have been obvious to

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one of ordinary skill in the art at the time the invention was made to modify the Shoji invention and disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. Shoji is concerned with (Problems to be Solved by the Invention, paragraph 8) lowering the dielectric constant (a.k.a. permittivity), which in turn would result in a lower product of permittivity and loss factor  $\tan$  of the dielectric layer. This equates to lower power consumption, which is another objective.

13. With respect to claim 24, Shoji discloses (Detailed Description, paragraph 4) a plasma display panel in which a space between a first plate and a second plate facing each other is filled with a discharge gas, a plurality of pairs of display electrodes made of Ag are formed on a surface of the first plate facing the second plate, and the surface of the first plate is covered with a dielectric layer covering the plurality of pairs of display electrodes. Shoji is silent as to the material of the display electrodes, but one of ordinary skill in the art would know that the use of Ag for display electrodes is well known. Shoji also discloses (Table 1, sample 2) the dielectric layer is made of a glass which is composed of 40-60 wt% of ZnO, 35-45 wt% of  $B_2O_3$ , 1-10 wt% of  $SiO_2$ , and 1-10 wt% of  $Al_2O_3$ .

Shoji does not disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. However, since the same materials are disclosed, one of ordinary skill in the art would assume this to be the case. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shoji invention and disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. Shoji is concerned with (Problems to be Solved by the Invention,

paragraph 8) lowering the dielectric constant (a.k.a. permittivity), which in turn would result in a lower product of permittivity and loss factor  $\tan$  of the dielectric layer. This equates to lower power consumption, which is another objective.

14. With respect to claim 25, Shoji discloses (Detailed Description, paragraph 4) a plasma display panel in which a space between a first plate and a second plate facing each other is filled with a discharge gas, a plurality of pairs of display electrodes made of Ag are formed on a surface of the first plate facing the second plate, and the surface of the first plate is covered with a dielectric layer covering the plurality of pairs of display electrodes. Shoji is silent as to the material of the display electrodes, but one of ordinary skill in the art would know that the use of Ag for display electrodes is well known. Shoji also discloses (Table 1, sample 2) the dielectric layer is made of a glass which is composed of 30-60 wt% of ZnO, 30-50 wt% of  $B_2O_3$ , 1-10 wt% of  $SiO_2$ , and 1-10 wt% of  $Al_2O_3$ .

Shoji does not disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. However, since the same materials are disclosed, one of ordinary skill in the art would assume this to be the case. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shoji invention and disclose a product of permittivity and loss factor  $\tan$  of the dielectric layer is 0.12 or less. Shoji is concerned with (Problems to be Solved by the Invention, paragraph 8) lowering the dielectric constant (a.k.a. permittivity), which in turn would result in a lower product of permittivity and loss factor  $\tan$  of the dielectric layer. This equates to lower power consumption, which is another objective.



***Allowable Subject Matter***

15. Claims 3, 4, 7, 8, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to disclose the dielectric layer contains 10-25 wt% of  $P_2O_5$ , 20-35 wt% of ZnO, 30-40 wt% of  $B_2O_3$ , 5-12 wt% of  $SiO_2$ , 10 wt% or less of  $R_2O$ , and 10 wt% or less of DO, wherein D is selected from a group consisting of Mg, Ca, Ba, Sr, Co, Cr, and Ni. Prior art also fails to disclose the dielectric layer is composed of a ZnO- $P_2O_5$ -base glass which contains 42-50 wt% of  $P_2O_5$ , 35-50 wt% of ZnO, 7-14 wt% of  $Al_2O_3$ , and 5 wt% or less of  $Na_2O$ . Prior art also fails to disclose the dielectric layer is composed of a ZnO-base glass which contains 1-15 wt% of ZnO, 20-40 wt% of  $B_2O_3$ , 10-30 wt% of  $SiO_2$ , 5-25 wt% of  $Al_2O_3$ , 3-10 wt% of  $Li_2O$ , and 2-15 wt% of MO, wherein M is selected from a group consisting of Mg, Ca, Ba, Sr, Co, and Cr. Prior art also fails to disclose the dielectric layer is composed of a ZnO-base glass which contains 35-60 wt% of ZnO, 25-45 wt% of  $B_2O_3$ , 1-10.5 wt% of  $SiO_2$ , 1-10 wt% of  $Al_2O_3$ , and 5 wt% or less of  $Na_2O$ . Prior art also fails to disclose the dielectric layer is composed of a ZnO- $Nb_2O_5$ -base glass which contains 9-19 wt% of  $Nb_2O_5$ , 35-60 wt% of ZnO, 20-38 wt% of  $B_2O_3$ , 1-10.5 wt% of  $SiO_2$ , and 5 wt% or less of  $Li_2O$ .

16. Claims 21, 26, and 27 are allowed.

17. The following is an examiner's statement of reasons for allowance: Prior art fails to disclose the dielectric layer is made of a glass which is composed of 20-30 wt% of

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P<sub>2</sub>O<sub>5</sub>, 30-40 wt% of ZnO, 30-45 wt% of B<sub>2</sub>O<sub>3</sub>, and 1-10 wt% of SiO<sub>2</sub> and a product of permittivity and loss factor tan of the dielectric layer is 0.12 or less. Prior art also fails to disclose the dielectric layer is made of a glass which is composed of 9-20 wt% of Nb<sub>2</sub>O<sub>5</sub>, 35-60 wt% of ZnO, 25-40 wt% of B<sub>2</sub>O<sub>3</sub>, and 1-10 wt% of SiO<sub>2</sub>, and a product of permittivity and loss factor tan of the dielectric layer is 0.12 or less. Prior art also fails to disclose the dielectric layer is composed of a first dielectric layer which either is a thin film of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> or ZnO or is made of a glass containing at least PbO or Bi<sub>2</sub>O<sub>3</sub> and covers the plurality of pairs of display electrodes, and a second dielectric layer made of a glass in which a product of permittivity and loss factor tan is 0.12 or less, the second dielectric layer covering the first dielectric layer.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee et al. (USPN 6,184,163 B1), Braude (USPN 4,578,619), Komaki (USPN 5,703,437), Tanaka et al. (USPN 6,160,345), and Aoki et al. (USPN 6,439,943 B1) disclose dielectric compositions.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Yun whose telephone number is 703 308-3535. The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703 308-7722 for regular communications and 703 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0956.

Jurie Yun  
May 27, 2003

